# C L A I M S

1. Nozzle unit for generating an abrasive jet, which nozzle unit comprises:
- a first nozzle connected to a pressurized carrier fluid supply, which first nozzle in a section thereof with its highest restriction defines a first nozzle opening having a cross sectional area $A_1$;
- a mixing chamber in which the first nozzle discharges;
- a second nozzle connected to the mixing chamber, which second nozzle in a section thereof with its highest restriction defines a second nozzle opening having a cross sectional area $A_2$; and
- an abrasive particle inlet discharging in the mixing chamber;

wherein the ratio $A_1/A_2$ is greater than or equal to 0.50 and lower than 1.

2. Nozzle unit according to claim 1, wherein the length in flow direction of the mixing chamber is such, that taking into account the divergence of the jet to be discharged from the first nozzle, the diameter of the jet leaving the mixing chamber is smaller than the diameter of the second nozzle opening.

3. Nozzle unit according to claim 1 or 2, wherein the length in flow direction of the mixing chamber is in the range of 0.8-2.0 times the diameter of the first nozzle opening.

4. Nozzle unit according to any of the preceding claims, wherein the length in flow direction of the second nozzle is in the range of 4-10 times the second nozzle diameter.

# C L A I M S

1. Nozzle unit for generating an abrasive jet, which nozzle unit comprises:
- a first nozzle connected to a pressurized carrier fluid supply, which first nozzle in a section thereof with its highest restriction defines a first nozzle opening having a cross sectional area $A_1$;
- a mixing chamber in which the first nozzle discharges;
- a second nozzle connected to the mixing chamber, which second nozzle in a section thereof with its highest restriction defines a second nozzle opening having a cross sectional area $A_2$; and
- an abrasive particle inlet discharging in the mixing chamber;

wherein the ratio $A_1/A_2$ is greater than or equal to 0.50 and lower than 1.

2. Nozzle unit according to claim 1, wherein the length in flow direction of the mixing chamber is such, that taking into account the divergence of the jet to be discharged from the first nozzle, the diameter of the jet leaving the mixing chamber is smaller than the diameter of the second nozzle opening.

3. Nozzle unit according to claim 1 or 2, wherein the length in flow direction of the mixing chamber is in the range of 0.8-2.0 times the diameter of the first nozzle opening.

4. Nozzle unit according to any of the preceding claims, wherein the length in flow direction of the second nozzle is in the range of 4-10 times the second nozzle diameter.

5. Nozzle unit according to any of the preceding claims, wherein the second nozzle is eccentrically arranged relative to the first nozzle.

6. Nozzle unit according to claim 5, wherein the eccentric displacement of the second nozzle has a component in the direction of the abrasive particle inlet.

7. Nozzle unit according to claim 5 or 6, wherein at least part of an inside wall of the first nozzle is aligned with at least part of an inside wall of the second nozzle.

8. Nozzle unit according to any of the preceding claims, comprising a supply channel connected to the abrasive supply inlet, wherein the supply channel surrounds the mixing chamber by an angle of less than 180°.

9. Nozzle unit according to any of the preceding claims, comprising a supply channel connected to the abrasive supply inlet, wherein the included angle between the flow direction in the supply channel and an axis along the flow direction of the primary nozzle, is smaller than 60°.

10. Combination of a nozzle unit according to any of the preceding claims and a separation device for separating magnetical or magnetizable abrasive particles from a fluid, which separation device comprises a magnet body for attracting the abrasive particles out of a fluid flowing along the separation device, and a support surface at least partially enveloping the magnet body, and means for transporting attracted abrasive particles along the support surface to the abrasive particle inlet of the nozzle unit.

11. Method of excavating a hole into an object, comprising the steps of:

- arranging an abrasive jet excavating tool comprising a nozzle unit according to any of the claims 1-9 into the hole;
- generating an abrasive jet by supplying a pressurized carrier fluid to the first nozzle and discharging abrasive particles into the mixing chamber; and
- directing the abrasive jet into the object.